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**Extraction and Characterization of a Red Pigment from *Talaromyces verruculosus* Isolated from Kalpitiya Lagoon, Sri Lanka****Peiris, K.C.T.<sup>1\*</sup>, Dissanayake, I.A.J.K.<sup>1</sup>, Ariyawansa, K.G.S.U.<sup>1</sup>, Kaumal, M.N.<sup>2</sup>**<sup>1</sup>*Department of Plant Sciences, University of Colombo, Colombo 03, Sri Lanka*<sup>2</sup>*Department of Chemistry, University of Colombo, Colombo 03, Sri Lanka**\*chithmitharika99@gmail.com***Abstract**

Colours play crucial roles in various aspects of life on Earth. Despite the inherent colouring capability of nature, synthetic dyes are being applied in almost every industry in the world, contributing to a diverse array of environmental and health issues. Therefore, there is a significant demand for top-notch alternatives capable of effectively replacing synthetic dyes. When considering sustainable alternatives, the dyes of fungal origin have been frequently highlighted over other plants or animal-based natural pigments. However, research on fungal pigments in Sri Lanka remains limited, with only a few studies reported to date. The prime goal of this present study was to investigate an effective method for the extraction of fungal pigment and characterization of the novel pigment product. Firstly, fungal cultures already preserved in the Department of Plant Sciences, University of Colombo, were screened for pigmented cultures (n=150). The selected pigmented fungus, *Talaromyces verruculosus*, was isolated from the lichen *Rocella montagnei* collected at the Kalpitiya Lagoon, Sri Lanka. Liquid state fermentation in a Potato Dextrose Broth medium was used to facilitate the synthesis of pigments. A metabolite was purified from culture broth with the aim of isolating an economically viable novel pigment. Following optimization of physical parameters of submerged fermentation, the pigment was extracted using ethyl acetate and purified by Thin-Layer Chromatography (TLC). The optimum fermentation conditions for achieving the highest pigment yield were determined to be a pH of 6.5 and a temperature of 32 °C. Based on the results of the ANOVA test followed by Tukey's HSD post hoc test, the pigment exhibits remarkable thermal stability between 40 °C and 80 °C, with noticeable degradation beginning at temperatures above 90 °C. Based on the Kruskal-Wallis rank sum test, the pigment remains stable across a pH range of 2 to 12. According to the UV-vis, FTIR, and NMR analyses, the pigment was chemically characterized as austrocortirubin which is a deep red, bioactive pigment from fungi, part of the anthraquinone aromatic polyketide family, with potential application in natural dyeing, pharmaceutical research, and bio-sustainable pigment production.

**Keywords:** *Red pigment, Submerged fermentation, Chemical characterization, Sustainability*